

Clinical Section

*Poliomyelitis in Manitoba 1936

By

C. R. DONOVAN, M.D., C.M. (Queen's),
D.P.H. (Tor.),

Epidemiologist, Department of Health,
Manitoba

The epidemic of poliomyelitis in Manitoba during 1936 is the most extensive on our records, there having been reported 539 cases. This figure represents the greatest concentration of the disease in any of our provinces during that year, as indicated by reports from the following provinces having more than 25 cases: Ontario—206 cases, Quebec—116 cases and Saskatchewan—77 cases.

The reported incidence of the disease in Manitoba during the past ten years shows the last epidemic to have occurred in 1928, with 434 cases. The next two years showed 55 and 45 cases respectively and, although cases were reported in each of the succeeding years up to 1936, the figures were relatively small. Whether such figures for inter-epidemic years indicate the extent of the disease may be open to question. For example, in 1935 there were 23 reported cases: 7 of them died, and of the remainder, 13 were definitely paralyzed, one had a stiff back for some time, one had clinical disease with no paralysis, and in one the diagnosis was doubtful. Comparing experience of this kind with that of epidemic years, there is reason to believe that this infection is more widespread than the figures reported for certain years would indicate.

In 1936 the first reported case was on April 29th from Ochre River, ending fatally in about four days. Nothing further was reported until June 22nd, when second and third cases arose at rather widely separated points in the province: one in Grey, which developed residual paralysis, and one in Morton, who also developed extensive residual paralysis. From this date cases occurred regularly in the Morton-Boissevain area, until by August 9th, 36 cases had developed, with only 7 in other parts of the province, and none within a radius of 50 miles. The general movement of the disease from this time on was east and north east, showing a tendency to appear along the main routes of travel, and by December 16th, when the last case was reported, 83 municipalities had been involved. The south central portion of the province was mainly affected; only a few cases appeared east of the Red River, four or five between the lakes and none in the Lake Dauphin-Winnipegosis area, or along the west side of Lake Manitoba.

Some localities appeared to have explosive out-

breaks, such as in Elton, where 16 cases occurred between September 21st and October 5th, others, such as the Morton area, had a gradual accumulation of cases over a longer period.

Seasonal Distribution: After the first case on April 29th, intervals of several days elapsed between subsequent cases, until July 29th, but from this time on till the first week in November, cases occurred every day. The full force of the outbreak was not felt until September 7th, and from that date there was a rapid increase of cases, until the peak was reached on September 24th. The week ending September 28th had the greatest number of reported cases. The trend downward from this point covered a period of almost three months, until December 16th, when the last case of the year was reported. Such a seasonal curve is fairly consistent in this climate, but further south the peak of their epidemics is reached somewhat earlier in the year.

Attack Rate: The 539 cases represent a rate of 75.7 per 100,000 of the population, which is considerably lower than the reported rate of 124.9 in Denmark during 1934. Other recent epidemics in Virginia, North Carolina and Kentucky report morbidity figures of 28.0, 21.3 and 12.3 respectively per 100,000 of the population. Similarly some districts in Manitoba fared worse than others, and most noticeable is the comparison between the cases reported from Morton and Winnipeg: Winnipeg had only 38 cases per 100,000 of the population, suburban Winnipeg a corresponding figure of 63, while the Morton district reported 2,000 cases per 100,000 of the population.

Cases in Urban and Rural Areas: Most of the cases occurred in the rural areas: 351 to 188 in urban centres, representing an attack rate of 90 and 58.9 respectively, as indicated in Table No. 1. Winnipeg and suburbs reported a relatively small number of cases, which may be partly explained by the community experience with the disease in 1928, when it was more widespread here than in most of the rural sections.

DISTRIBUTION OF POLIOMYELITIS CASES IN MANITOBA, 1936 URBAN AND RURAL

TABLE NO. 1

	Urban Cases	Per 100,000	Rural Cases	Per 100,000
Winnipeg	82	38.4		
Suburban Winnipeg	41	63.1		
Brandon	18	101.3		
Portage la Prairie	4	61.3		
Towns of 1,000 to 5,000 pop.	43	172.0		
Rural and Small Villages			351	90.0
Totals	188	58.9	351	90.0

The deaths per 100 cases in the rural areas were 7.1, as compared with 3.8 for Winnipeg and 4.7 in the other urban centres.

* Paper delivered before the Manitoba Medical Association, May 20, 1937.

Cases by Age Groups: The great concentration of cases was in the age group 5 to 9 years inclusive, as seen in Table No. 2. The percentage of cases in the youngest group is smaller than usual, being only about one half the proportion recorded for the 1928 epidemic. It is also noteworthy that the age grouping in some areas shows considerable difference; for instance, in Winnipeg only about 10 per cent of the cases were over fourteen years of age, while in Morton over 50 per cent of their cases were in this older group.

DISTRIBUTION BY AGE GROUPS
POLIOMYELITIS IN MANITOBA, 1936
539 Cases—33 Deaths

TABLE NO. 2

Ages	Cases	Deaths	Case Fatality Rate	Case Incidence per 100,000 per each age group
0- 4	85	1	1.2	151
5- 9	208	5	2.4	280
10-14	120	10	8.3	159
15-19	71	11	15.5	89
20 and Over	55	6	10.9	12
Total	539	33	6.1	75.7

Sex: The sex distribution in practically all epidemics shows a preponderance of males over females. This was so in 1936, with 291 males and 248 females. This distribution does not apply to all age groups: the males being in the majority up to the age of ten, between ten and fourteen the sexes being about equally divided, while above the age of fourteen the female cases were more numerous.

Multiple Cases in Homes: The extent to which multiple cases occurred in homes is a point on which accurate information is somewhat difficult to obtain, but there is reason to believe they occur more frequently than is generally considered to be the case. The cases reported in Manitoba during 1936 were in 460 different homes: 403 of these homes reported only single cases, 43 had 2 cases, 8 had 3 cases, 5 had 4 cases, and 1 reported 5 cases. In the urban portions of the province 8 per cent of the homes had more than one case, as compared with 15 per cent in the rural areas. The necessary information was not available with which to work out the attack rates in these homes. It is not entirely clear whether the subsequent cases are true secondary cases, or are simply part of a widespread community infection. However, the information obtained from 32 homes shows that 83 per cent of their secondary cases developed during the first eight days following the initial cases in the household, but it does not necessarily follow that this is an indication of the incubation period.

Diagnosis: The diagnosis in most instances was made on the clinical symptoms, and I think that the majority of the cases were seen by more than one physician, so that we feel that the number of cases reported is no exaggeration of the prevalence.

Diagnosis is not always an easy matter, but given the primary suspicion in the observer's mind, it may be made before the appearance of

the pathonomic paralysis. In the early stage, with systemic symptoms of fever, rapid pulse, headache, drowsiness, irritability, abnormal sweating, retention of urine and, quite frequently, sore throat, there are sufficient grounds, according to various writers, to make a tentative diagnosis of poliomyelitis. The abatement of these symptoms may terminate the attack or, after a quiescent period of a few hours or days, they may return with increased vigor, with the addition of meningeal symptoms evidenced by pain and stiffness in the cervical or lumbar region, alteration of the reflexes or hyperaesthesia. Moderately severe cases in this stage present a picture which is almost typical—flushed cheeks, circumoral pallor, eyes bright and dry, apprehensiveness in that the child lies quiet and still, does not want to be bothered and seems aware of some impending danger. Some of the cases presented somewhat unusual symptoms: a couple had symptoms which could probably best be described as polio-encephalitis, and three or four had abdominal pain which was such a prominent factor that a laparotomy had been seriously considered to deal with what appeared to be appendicitis.

The information obtained from spinal punctures as an aid to diagnosis must be used with reservations so far as the cell count is concerned. Of 170 patients on whom spinal puncture was reported, 39, or practically 22 per cent had a count of 10 or less, and all but three had less than 9 cells.

As reports from attending physicians accumulated, it became evident that some individuals were not seeking medical advice as early as they should after the first symptoms of illness, as it seemed that too many patients were not being seen until after paralysis had set in. Such delay was, in many instances, due to lack of finances, and in order that the financial barrier between the sick person and medical advice should be removed insofar as possible, an arrangement was made with the municipalities to provide medical service for the diagnosis and treatment of the disease on the basis with which you are all familiar. The reasons for such a service are in general no different than for other diseases, but, due to the peculiarities of poliomyelitis, the necessity is more apparent, first, to get the infected individual out of circulation as quickly as possible and establish proper isolation measures; second, to establish proper treatment along general lines, of which rest and quiet appear to be an important factor; and third, for the early administration of convalescent serum. Those with whom I have discussed the subject were of the opinion that rest was often not sufficiently stressed in the after care of many cases. It was observed that weakness of muscle groups became apparent soon after the patient resumed activity. In some of such cases after a night's rest the limb would appear to function normally for an hour or two, but after this, evidence of muscle weakness would again be apparent.

Reported Results of Serum Treatment: The serum used during the 1936 epidemic was collected and prepared by the Provincial Bacteriologist, Dr. F. T. Cadham.

Serum treatment of the cases was as follows:

539 Cases —454 received serum.
60 received no serum.
25 not reported on.

454 treated with serum—395 or 73% received it before the onset of paralysis.
59 had serum after onset of paralysis.

These 395 patients who received serum before the onset of paralysis were treated at intervals of 24 hours or less to 4 days or over after the onset of the disease. 232 patients received treatment during the first 24 hours, and 93 per cent of these recovered. As the time interval between treatment and onset increased the percentage of recoveries decreased, until only 61.5 per cent of those treated after four days recovered without paralysis.

In the group of 119 patients who either had no serum or were treated after the onset of paralysis, 36.1 per cent recovered, 52.1 per cent developed residual paralysis and 11.8 per cent died.

The above cases include both those in whom the diagnosis was made on clinical grounds and those in which there was also corroborative evidence in the spinal fluid. In reviewing the 131 cases who had spinal fluid cell counts of over 10 cells, it is found that 55 had serum within 36 hours of the onset of the disease, and of these, 92.7 per cent recovered, 5.5 per cent had residual paralysis, and 1.8 per cent died, while of the remainder, who either had no serum, had it after 36 hours from the onset, or after paralysis, 56.6 per cent recovered, 36.8 per cent developed residual paralysis and 6.6 per cent died.

Outcome of 539 Cases: Reports indicate that out of the total cases there were 210 who had some detectable muscular involvement during the course of the disease; however, during the interval which elapsed between the epidemic and the final compilation of these figures, it was found that 75 of these 210 cases were considered as having recovered, so that the net result of the epidemic as it stood early in 1937 is as follows:

Deaths	33
Residual Paralysis	102
Recovered	404
Total	539

More recent information on these 102 cases of residual paralysis indicates that approximately 10 per cent have now essentially recovered; the remainder of the cases, under proper treatment show encouraging progress.

Note: Acknowledgment is made to the physicians and hospitals of Manitoba of their co-operation in supplying information contained in this paper.

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Editor

C. W. MACCHARLES, M.D. (MAN.)

Advisory Editor

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Public Ward Services Under "The Hospital Aid Act" City of Winnipeg Cases

By

MORLEY S. LOUGHEED, B.A., M.D. (Man.)
Assistant Medical Health Officer, Winnipeg

As a result of an investigation into the cost to the City of Winnipeg of the hospitalization of patients under "The Hospital Aid Act" the City Health Department has been requested to introduce a plan of medical supervision of those public ward services for the cost of which the City is liable. During this investigation a number of facts and figures have been summarized which should be of interest to members of the medical profession.

Under the above Act the municipalities are liable for the hospital accounts at a fixed daily rate for patients unable to pay their own way. It was to be expected that during this depression, the number of admissions to the hospitals of this class of patient would increase and likewise the total costs for which the municipality is liable and, in the main, pays. Whether the great increase is warranted by general economic conditions is another question.

The following table shows the extent of this problem so far as it applies to the City of Winnipeg. The admissions are those of which notification has been received and includes those in which the City "disputes" its liability under the Act. The total fees paid are the sums paid by the City to the hospitals although the Treasurer's Department manages to collect a varying percentage from the patients.

	Total Admissions Notified	Total Fees Paid
1929	8,844	\$238,930.00
1930	10,422	266,707.00
1931	12,034	343,690.00
1932	13,535	378,970.00
1933	13,271	354,282.00
1934	14,028	339,111.00
1935	15,113	368,491.00
1936	16,120	351,409.00

The admissions have almost doubled since 1929 and it is difficult to explain the increase during the last three years. In 1933 there was a reduction in the statutory daily rate from \$1.75 to \$1.50.

CLASSES OF PATIENTS

The patients receiving these services may be put in one or other of the following groups arranged more or less in order of importance from the viewpoint of cost to the City:

1. Not on relief or allowances but unable to pay for medical services.
2. Registered under the Unemployment Relief Commission.
 - (a) Married men and families.
 - (b) Single men.
 - (c) Women's Department.
3. Under the care of the Social Welfare Commission.
4. On Old Age Pensions.
5. D. S. C. R. (War pensioners' families).
6. On Veteran Allowances.
7. On Mothers' Allowances.
8. On other small pensions and allowances.

RELATION OF THE MEDICAL HEALTH OFFICER

The Hospital Aid Act gives the Medical Health Officer considerable authority in that his written permission must be obtained prior to admission except in cases of urgency. Even where it is "unwise to delay admittance" a "certificate specifying the reason for the immediate admission of the patient" is to be mailed to the Medical Health Officer. However, the Act gives the Medical Health Officer permission to delegate his authority to the Superintendents of the hospitals thus greatly simplifying the procedure of admission. Some municipalities refuse permission for medical cases and "dispute" the urgency

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in others—a plan which would cause undue hardship and contention if applied to the City of Winnipeg cases.

RELATION OF THE PHYSICIANS

Apart from the fees received for medical attendance on those registered under the Unemployment Relief Commission (Married Men's Department) and possibly from a few in Class I. above, the physicians and surgeons give their services gratuitously and can have no financial motive for either recommending admission or extending the stay in hospital. At the same time the physicians in attendance exercise an important influence in both respects.

The question of the need for hospitalization must necessarily remain, as always, a responsibility of the attending physician in regards both to admission and to the length of stay although the Superintendent of a hospital may see fit to select the cases for which his particular hospital renders service. In general the physician in attendance has met with little or no interference when he recommends for admission or for continuance of treatment a case for which the City pays the cost of hospital care.

RELATION OF THE HOSPITALS

A feature of this investigation has been the welcome accorded offers of assistance from this Department in combating this problem. Delays are not uncommon in arranging suitable accommodation for patients on discharge or completion of active treatment. Some patients are to be transferred to institutions requiring a formal application and some are from homes where conditions are not the best for after care. Again, other patients may require periods of observation while others only nursing care. These along with other reasons for prolonging the stay in hospital, by accumulation, help to swell the total of unnecessary hospitalization and the cost to the City without adding to the welfare of the patients, the hospital, and needless to say, of the physicians in charge.

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NEWS ITEMS

ZINC SULFATE PROPHYLAXIS IN POLIOMYELITIS

Following recent discoveries that certain chemicals when applied to the olfactory area of the nose appeared to protect monkeys from poliomyelitis, Armstrong and Harrison, in 1936, reported favourably on the use of picric acid and sodium alum solution for this purpose. On July 17th, 1936, a statement concerning the use of this material was made in the United States Treasury Department Public Health Reports, and since the disease was present in epidemic form in Manitoba and Alabama, the picric-alum solution was used extensively in both places.

In Manitoba the solution was applied under such varying circumstances, and with the involvement of so many unknown factors, that no serious attempt was made to evaluate its efficacy as a prophylactic. The use of this spray in Alabama was reported on by Charles Armstrong in the A.J.P.H., Feb. 1937. He was unable to arrive at any definite conclusions regarding its prophylactic effect during the epidemic in that State.

There was still so much evidence that the proper application of certain chemicals would prevent the disease in experimental animals that further investigation into the proper technique for its use in man seemed indicated. With this in view, the President's Birthday Ball Commission for Infantile Paralysis supplied funds for further research into the action of certain chemicals, to be undertaken at Stanford University, and on the technique of application at Ann Arbor, Michigan. The following extracts are from the reports on this work, appearing in the Journal of the American Medical Association June 26, 1937, under the title, "Zinc Sulfate Prophylaxis in Poliomyelitis," E. W. Schultz, M.D., and L. P. Gebhardt, M.A.:

"The remarkable protection yielded by this simple and relatively nontoxic agent in animals suggests the desirability of carrying the investigation over to man. We say 'investigation' advisedly, for it does not necessarily follow that the results which have been obtained in monkeys apply equally in man. Therefore, with the most important question still to be answered—that of its effectiveness in man—there must be no relaxation of the principles that must guide a research in carrying the investigation over to man, for, unless great care is exercised, no really helpful information will be likely to come out of such further work. In a critical review of the application of picric-alum solution in Alabama last summer, Armstrong points out the pitfalls that beset a satisfactory field test. The observations that he presents in this paper make it very clear that the application of a prophylactic measure such as this must be kept entirely in the hands of those who are fully competent to apply it properly. It is not a prophylactic measure which can be turned over to the public for self administration. It is already known that in order to be effective the agent must be actually applied to the olfactory mucosa and that adequate coverage of this area is not assured by self administration with an ordinary hand atomizer.

With these considerations in mind, we would suggest the following procedure in carrying this investigation over to man:

1. The use of a solution containing 1 per cent. zinc sulfate 0.5 per cent. sodium chloride and 1 per cent. local anæsthetic (pontocaine) as suggested.

2. The solution should be prepared with U.S.P. zinc sulfate, U.S.P. sodium chloride and distilled water.

3. It should be applied at least once every two weeks during times when the risk of infection is great. A more desirable procedure would be to apply the agent on two or three successive days and once every two weeks thereafter. The latter would naturally prove more difficult to carry out in actual practice.

4. It should be applied with an atomizer equipped with a suitable tip, and in accordance with the technique described by Dr. Max Peet in this issue of the Journal.

5. Since the zinc sulfate solution thoroughly applied in this manner, may be somewhat painful, Dr. Peet suggested several months ago that we determine whether the addition of 0.5 per cent. pontocaine to the zinc sulfate solution detracts in any way from its action. From the results of tests on 32 monkeys treated with a solution containing 1 per cent. zinc sulfate and 1.5 per cent. pontocaine, we can say definitely that pontocaine in no way detracts from the protective action of the zinc sulfate. The influence of other local anæsthetics on the prophylactic action of this agent are now being studied by us.

6. The prophylactic zinc sulfate mixture should be administered under the auspices and supervision of national, state or local health organizations, aided by members of the medical profession who have been instructed in the special technique that should be followed. This calls for some previous organization of local health forces.

7. A record should be kept in the local health office of all persons treated. These should bear the name, age, address of the person treated, dates of all treatments and a notation of any anatomic conditions in the nasal passages, which may have interfered with a satisfactory application of the solution. The general health of the individual should also be noted.

8. Those who supervise the treatment should be alert to any possible side actions, or important harmful local or general effects. While we have not observed any noteworthy growth or microscopic changes in the nasal mucous membranes of monkeys treated repeatedly with zinc sulfate, other than a mild grade of inflammation, such as may be seen at times even in untreated monkeys, it nevertheless seems important to suggest alertness to any effects which may contraindicate the general use of this agent or agents if pontocaine is included in the solution. Although there is no good reason to believe the zinc sulfate, in the small amounts required to cover the olfactory area, would produce any undesirable or harmful effects, either local or general, idiosyncrasies should be kept in mind.

9. Any objectionable or undesirable effects from the treatments should be reported to the local health officer, who should enter the information on the card and take such steps as may seem desirable.

10. In measuring the results later, only those persons who have received adequate treatments under competent supervision, and for whom there is a record of treatment on file, should be considered as having received valid treatments. Claims of self administration of the solution should not be regarded as valid.

The first practical human application of any such laboratory observation as this must of necessity be in the nature of an investigation, and unless this part of the work is carried out with care it is unlikely that any significant additional information will be obtained from such field application. While further laboratory studies may in time lead to a more satisfactory procedure, the immediate task before the profession is to make the best possible use of the most promising practical measure now available for the control of the disease."

Max M. Peet, M.D., Dean H. Echols, M.D., and Harry J. Richter, M.D., deal with the "Technique of Applying Zinc Sulfate Intranasally" in part as follows:

"The actual application of zinc sulfate solution to the olfactory area has been found more difficult than was anticipated. It is apparently much simpler to cover the olfactory area in monkeys than in human beings.

. . . Direct nasal examination after spraying a large number of children with methylene blue showed that in practically all instances the solution did not go above the middle turbinate if an ordinary atomizer was used with the tip of the spray introduced only slightly within the nostril. . . . From our experiments in which radiopaque substances and certain dyes were used it is evident that the spray must be applied directly to the olfactory area. Such application can be made under direct vision with an atomizer with a long narrow metal tip. (DeVilbiss Atomizer No. 156, with spray tip No. 156, N.C.).

Nasal douching with the head in the Proetz position might be as effective in some children as a properly applied spray. However, it would require larger quantities of the solution with the probability that some of the anæsthetic would enter the accessory sinuses and pharynx with the possibility that the cough reflex might be abolished, thus predisposing to pneumonia. The Proetz position with instillation of zinc sulfate by dropper may of necessity be used when small children are so unco-operative that insertion of the nasal spray tip is impossible. Under these circumstances the pontocaine should be omitted. The child should be kept in the head-down position for about two minutes.

We recommend the following method of application: The subject is seated and an attendant holds the head tilted backward about 45 degrees. This is the usual position for a nasal examination. A speculum is introduced into the naris and under direct vision the spray tip is inserted upward along the septum until definitely past the middle turbinate. If it impinges on the roof of the nose it is slightly withdrawn. The bulb is squeezed the number of times required to introduce 1 cc. of solution. This amount, according to our x-ray and necropsy evidence, completely covers the olfactory area. A similar procedure is then carried out on the opposite side of the nose. Loss of the olfactory sense is thus obtained.

Only slight discomfort is felt when the spray tip is passed through the narrow cleft between the middle turbinate and the septum, or when it touches the roof of the nose. If the nasal passage is found occluded on direct inspection, the nasal mucous membrane should be shrunken by the application of ephedrine or benzedrine inhalant preliminary to the insertion of the spray tip. A power sprayer can be used instead of a hand bulb, but should not deliver more than a few pounds of pressure. The quantity delivered by the power sprayer should be definitely determined and not more than 1 cc. of the solution introduced into each side of the nose.

According to the experimental work of Schultz, a single spray of zinc sulfate and pontocaine is sufficient to protect animals for at least two weeks. However, in our experiments on man we have repeated this spray for three successive days. Such intensive spraying, while perhaps not necessary, does give greater assurance of complete coverage, since on the first application of the spray there may be small areas covered by tenacious secretions which conceivably would not be present on the same areas on succeeding days. Possibly in an extensive field application of the zinc sulfate for the prevention of poliomyelitis a single spray repeated at intervals of two weeks would be sufficient; however, we recommend daily spraying for three consecutive days, then single sprays at intervals of two weeks.

It is evident that to be effective, the spray must be directly applied to the olfactory area. We wish especially to emphasize this point. Ordinary spraying with the atomizer tip introduced below the middle turbinate will not suffice, except in isolated instances. Therefore, to offer a child the only protection now

known for the prevention of infantile paralysis, the spray solution must be actually applied to the olfactory area, and this can be accomplished only under direct observation, with proper equipment and by one trained in this particular technique. It is not a procedure which can be applied by the parents, or by a physician not familiar with intra-nasal work."

Apparently the application of the zinc sulfate solution, with or without the pontocaine, to the olfactory area, causes a temporary loss or impairment of the sense of smell, which returns in from one to two weeks.

The 1 per cent. zinc sulfate solution when used alone causes burning, smarting and coryza and more or less severe headache which may last for several hours. If the solution only reaches the lower part of the nasal passage and does not cover the olfactory area, these symptoms do not appear. The addition of the pontocaine (1%) (Winthrop) completely eliminates or minimizes the discomfort following the use of the zinc sulfate alone. The intensity of these reactions varies with different individuals.

—C. R. D.

COMMUNICABLE DISEASES REPORTED

Urban and Rural - June, 1937.

Occurring in the Municipalities of:

Measles: Total 569—Winnipeg 196, Brenda 103, Arthur 38, St. James 26, Unorganized 26, Kildonan East 16, Norfolk North 10, St. Clement 10, Boissevain 8, St. Vital 8, Melita 6, Rockwood 6, Rosssburn Village 4, Springfield 4, Whitehead 4, Napinka 3, Rosssburn Rural 2, Whitewater 2, Albert 1, Assiniboia 1, Brandon 1, Dauphin Town 1, Edward 1, Flin Flon 1 Rhineland 1, Shell River 1, Shoal Lake Rural 1, St. Andrews 1, St. Boniface 1, The Pas 1, Winnipeg Beach 1 (Late Reported: March, Springfield 1; April, St. Boniface 2; May, Rockwood 32, Brooklands 5, St. James 2, Brenda 1, Rosser 1).

Whooping Cough: Total 441—Winnipeg 241, Unorganized 81, St. Boniface 66, Kildonan West 17, Norfolk North 14, Macdonald 12, Kildonan E. 5, Winnipeg Beach 1 (Late Reported: May, Kildonan West 2, Kildonan East 1; March, Unorganized 1).

Scarlet Fever: Total 90—Winnipeg 38, Albert 8, Archie 4, Teulon 3, Armstrong 2, Fort Garry 2, Kildonan West 2, Rockwood 2, Arthur 1, Cartier 1, Lac du Bonnet 1, Macdonald 1, Russell Town 1, St. Boniface 1, Thompson 1, Whitemouth 1.

Chickenpox: Total 84—Winnipeg 41, Flin Flon 7, Grandview Town 6, Brandon 4, Lorne 4, Kildonan East 1, Mossey River 1, St. James 1 (Late Reported: May, Mossey River 9, Flin Flon 5, Kildonan East 4, Kildonan North 1).

Tuberculosis: Total 66—Winnipeg 19, Brandon 12, Flin Flon 3, Brokenhead 2, Harrison 2, Kildonan East 2, Rockwood 2, Selkirk 2, St. Andrews 2, Unorganized 2, Bifrost 1, Dauphin Town 1, Dauphin Rural 1, DeSalaberry 1, Ethelbert 1, Hillsburg 1, Kildonan West 1, Lac du Bonnet 1, Lawrence 1, Macdonald 1, Portage City 1, Stanley 1, St. Boniface 1, St. James 1, St. Rose Rural 1, St. Vital 1, Teulon 1, Woodlands 1.

Mumps: Total 15—Winnipeg 6, Brooklands 3, Harrison 1, St. Boniface 1, Unorganized 1 (Late Reported: May, Brooklands 3).

German Measles: Total 10—Roland 5, Kildonan North 1 (Late Reported: May, Kildonan West 4).

Erysipelas: Total 10—Winnipeg 6, St. Boniface 2, Kildonan West 1, Morton 1.

Influenza: Total 10—(Late Reported: April, Garson Village 1, Hartney Town 1, Macdonald 1, Pilot Mound 1, Portage City 1, Roland 1, Shell River 1, St. Andrews 1, St. Clement 1, Unorganized 1).

Diphtheria: Total 8—Winnipeg 3, McCreary 2, Carman 1, Roblin Town 1, St. James 1.

Trachoma: Total 3—Stanley 3.

Anterior Poliomyelitis: Total 1—Glenella 1.

Puerperal Fever: Total 1—Winnipeg 1.

Diphtheria Carriers: Total 1—Winnipeg 1.

Venereal Disease: Total 100—Gonorrhoea 70, Syphilis 30.

DEATHS FROM ALL CAUSES IN MANITOBA

For the Month of May, 1937.

URBAN—Cancer 35, Pneumonia 24, Tuberculosis 7, Measles 4, Syphilis 2, Influenza 1, all others under 1 year 4, all other causes 159, Stillbirths 16. Total 252.

RURAL—Cancer 18, Pneumonia 18, Tuberculosis 17, Influenza 9, Measles 2, Typhoid Fever 2, Whooping Cough 1, Syphilis 1, all others under 1 year 6, all other causes 189, Stillbirths 15. Total 277.

INDIAN—Tuberculosis 8, Influenza 3, Pneumonia 3, all others under 1 year 2, all other causes 7, Stillbirths 0. Total 23.

Medical Library University of Manitoba

Current Medical Literature

The Canadian Medical Association Journal— June, 1937.

Control of Diabetes Mellitus with Protamine Zinc Insulin in Surgery (Based upon a Study of 25 Cases). By A. F. Fowler, E. H. Bensley and I. M. Rabinowitch, Montreal.

Spontaneous Subarachnoid Haemorrhage and Brain Tumour (a Report of 3 Cases). By C. K. Russell, M.D., F.R.C.P. (C.) and J. Kershman, M.Sc., M.D., Montreal.

Practical Perimetry: Construction and Operation of the Tangent Screen. By A. J. McLean, M.D., F.A.C.S., Portland, Ore., U.S.A.

Experimental Gas Embolism: 1. Intravenous Air Embolism. By H. F. Richardson, B. C. Coles and G. E. Hall, Department of Medical Research, Banting Institute, University of Toronto.

A Case of Congenital Malformations of Vessels of the Brain and Spinal Cord. By J. A. Hannah, B.A., M.D., C.M., Toronto.

Multilocular Polycystic Tumour of the Pancreas. By Robert E. McKechnie, II, M.D., Fellow in Surgery, The Mayo Foundation and James T. Priestley, M.D., Division of Surgery, The Mayo Clinic, Rochester, Minn.

The Treatment of Scoliosis. By R. G. Huckell, M.D., Edmonton.

Hay Fever in Alberta. By Heber C. Jamieson, M.B., Edmonton.

Coincidental Diabetes Mellitus and Renal Glycosuria. By E. Lozinski, M.Sc., M.D. and L. I. Frohlich, B.Sc., M.D., C.M., Montreal.

Puerperal Infection. By Ross Mitchell, M.D., Winnipeg.

A New Method of Rhinoplasty for Sinking of the Tip of the Nose. By J. N. Roy, F.A.C.S., Professor in the University of Montreal.

Haematoma of the Abdominal Wall Simulating Intra-

Abdominal Tumour. By Hermann M. Robertson, C.B.E., F.R.C.S. (Edin. & C.), F.A.C.S., Victoria, B.C.

A Table for the Degree of Involvement in Chronic Arthritis. By Douglas Taylor, B.A., M.D., C.M., Demonstrator in Medicine, McGill University; Associate in Medicine at the Royal Victoria Hospital, Montreal.

Measurement of Blood Loss in Nose and Throat Operations. By F. D. McKenty, M.D., F.R.C.S. (C.), Winnipeg.

Internal Secretions and Cancer. By Pauline Beregoff-Gillow, Ph.G., N.S., M.D., Formerly Director of Experimental Medicine and Professor of Pathology and Parasitology of the University of Cartagena, Colombia, S.A., Ex-Fellow in Cancer Research of the New York City Cancer Institute, Montreal.

Modifications of Marshall's Clinical Method for the Determination of Urinary Urea. By Andrew Hunter, Toronto.

Some Recent Advances in the Treatment of Certain Conditions of the Anus, Rectum and Colon. By Lionel E. C. Norbury, O.B.E., M.B., B.S., F.R.C.S., Senior Surgeon, St. Mark's Hospital for Rectal Diseases; Surgeon, Royal Free Hospital; Consulting Surgeon, Belgrave Hospital for Children and West Middlesex County Hospital.

The Conservative Treatment of Acute Infections. By Sir David Wilkie, Professor of Surgery, University of Edinburgh.

The Diagnosis and Treatment of Gall-Stones. By Richard Warren, F.R.C.S., Consulting Surgeon, London Hospital.

Glaucoma. By W. B. Inglis Pollock, F.R.F.P.S.G., Surgeon, Glasgow Eye Infirmary.

Influenza in Adolescents. By Ronald E. Smith, M.B., M.R.C.P., Medical Officer of Rugby School.

The Common Cold. By W. G. Scott-Brown, M.D., Camb., F.R.C.S., Assistant Surgeon, Central London Throat, Nose and Ear Hospital.

Endometrioma of the Vulva. By T. N. A. Jeffcoate, M.D., Liverpool, F.R.C.S., Edin., M.C.O.G., Hon. Assistant Surgeon, Women's Hospital and Maternity Hospital, Liverpool; Tutor in Clinical Gynaecology, University of Liverpool.

The Clinical Journal—June, 1937.

The Indications for Caesarean Section. By Andrew M. Claye, M.D., F.R.C.S., Honorary Obstetric Surgeon, Leeds Maternity Hospital; Honorary Surgeon, Hospital for Women at Leeds; Professor of Obstetrics and Gynaecology, University of Leeds.

Lung Abscess. By James Maxwell, M.D., F.R.C.P., Physician, Royal Chest Hospital; Assistant Physician, St. Bartholomew's Hospital; Consulting Physician, Royal National Sanatorium, Bournemouth.

Some Clinical Aspects of Myocardial Disease. By Thomas F. Cotton, M.D., C.M., McGill, F.R.C.P., Lond., Physician, National Heart Hospital.

Cataract and the Cataract Patient. By A. J. Ballantyne, M.D., Professor of Ophthalmology, Glasgow University.

Cystic Hygroma. By Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital.

Haemophilia. By G. L. Lyon-Smith, M.B., M.R.C.P., Assistant Physician, Royal Sussex County Hospital.

Anxiety. By H. Wilfred Eddison, M.A., M.D., D.P.M., Camb., Medical Superintendent, Wonford Mental Hospital, Exeter.

Fibroid Impacted in the Pelvis; Forceps Delivery. By Michael W. Bulman, M.D., M.S., F.R.C.S., M.C.-O.G., Obstetric and Gynaecological Surgeon, Norfolk and Norwich Hospital.

Lancet—March 6, 1937.

Thrombo-Angitis Obliterans. By E. D. Telford, B.Chir., Camb., F.R.C.S., Eng., Emeritus Professor of Surgery, University of Manchester. (From the Department of Clinical Research in Disorders of the Autonomic Nervous System, Manchester Royal Infirmary).

The Medical Treatment of Non-Malignant Pyloric Stenosis in Adults. By T. Izod Bennett, M.D., F.R.C.P., Lond., Physician with Charge of Out-Patients, Middlesex Hospital, London.

A Review of Gold Therapy. By W. S. C. Copeman, M.D., Camb., M.R.C.P., Lond., Physician to the British Red Cross Society's Clinic for Rheumatism, London, and Assistant Physician to the Children's

Department of the West London Hospital; and W. Tegner, B.M., Oxon., M.R.C.P., Lond., Chief Assistant at the Clinic.

Striae Atrophicae Cutis. By David B. Rosenthal, M.D., Melb., M.R.C.P., Lond., Medical Superintendent of the Gresswell Sanatorium, Mont Park, Victoria, Australia.

Anaesthesia for Intracranial Operation. A New Technique. By Philip Ayre, M.R.C.S., Eng., Anaesthetist to Royal Victoria Infirmary and Newcastle General Hospital; and Hon. Anaesthetist to Babies' Hospital, Newcastle-Upon-Tyne.

Lancet—March 13, 1937.

The Treatment of Acute Rheumatism in Childhood. By Reginald Lightwood, M.D., F.R.C.P., Lond., Assistant Physician for Diseases of Children at the Westminster Hospital; and Physician to Out-Patients at the Hospital for Sick Children, Great Ormond Street, London.

Nitrous Oxide Analgesia in Obstetrics. A New Type of Machine for Self-Administration of Gas. By Chas-sar Moir, M.D., F.R.C.S., Edin., F.C.O.G., Reader in Obstetrics, University of London, at the British Postgraduate Medical School.

Turmeric (Curcumin) in Biliary Diseases. By Albert Oppenheimer, M.D., Assistant Professor of Roentgenology to the American University of Beirut, Lebanon.

The Anti-Curare Action of Substance 36: Closely Related to Prostigmin. By Grace Briscoe, M.B., Lond. (From the Physiological Laboratory, London (R.F.H.) School of Medicine for Women).

Sporadic Salmonella Infections: with a case report. By J. H. Fisher, M.B., Sydney, M.R.C.P., Lond., Medical Registrar at the Southend-On-Sea General Hospital.

Hernio-Appendectomy. By John T. Morrison, O.B.E., F.R.C.S., Honorary Surgeon, Royal Southern Hospital, Liverpool; Lecturer in Clinical Surgery, University of Liverpool.

Sulphaemoglobinaemia Following Sulphanilamide Treatment. By George Discombe, B.Sc., Lond., Junior Demonstrator of Chemical Pathology, St. Bartholomew's Hospital, London.

The Practitioner—June, 1937.

CARE OF THE PRE-SCHOOL CHILD

The Care of the Pre-School Child: Foreword. By the Rt. Hon. Sir Kingsley Wood, P.C., M.P., Minister of Health.

Acute Respiratory Disorders in the Pre-School Child. By Charles McNeil, M.A., M.D., F.R.C.P., Professor of Child Life and Health, Edinburgh University.

Tuberculosis in the Child of Pre-School Age. By Leonard Findlay, M.D., D.Sc., F.R.C.P., Physician, Princess Elizabeth of York Hospital for Children.

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